

APPENDIX D-1
AIR QUALITY AND GLOBAL CLIMATE CHANGE SUPPLEMENTAL ANALYSIS
OTAY RANCH RESORT VILLAGE 13 – ALTERNATIVE H

JANUARY 30, 2019

PREPARED FOR:
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Memorandum

To:	County of San Diego	From:	Valorie Thompson
Re:	Otay Ranch Resort Village EIR Alternative H	Date:	January 30, 2019

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Introduction

This technical memorandum addresses the criteria pollutant and greenhouse gas (GHG) emissions associated with Alternative H for the Otay Ranch Resort Village.

As described in the Environmental Impact Report (EIR), Alternative H is proposing to develop the project site with predominantly the same land uses as the Proposed Project, but with a denser and more compact development footprint. More specifically, Alternative H includes the following land uses:

- 1,881 single-family dwelling units
- 57 multi-family dwelling units
- 20,000 square feet of mixed use retail uses
- HOA facility
- 200-room resort hotel with 20,000 square feet of ancillary retail/commercial uses
- Elementary school
- Public safety building
- 25.1 gross/19.63 net acres of parks

With the exception of the HOA facility, which is not part of the description for the Proposed Project, these same land uses have been studied in the EIR's Air Quality and Global Climate Change Sections.

The purpose of this analysis is to evaluate the criteria pollutant and GHG emissions from Alternative H and to provide a comparison with the Proposed Project's criteria pollutant and GHG emissions.

Emissions Analysis

To provide an analysis for Alternative H that is consistent with the analysis conducted for the Proposed Project, the same approach was used to quantify criteria pollutant and GHG emissions. Because the number of units and total development is largely the same as the Proposed Project, operational emissions under Alternative H would be the same as or similar to those estimated for the Proposed Project.¹ Further, while no specific analysis is currently available, actual operational criteria pollutant and GHG emissions would likely be lower for Alternative H than the Proposed Project, because the development is more compact and internal trip distances would be lower.

The main difference in criteria pollutant and GHG emissions would be associated with construction of the project. The difference is attributable to the more compact development footprint, which serves to reduce the extent of construction-related activity.

Criteria Pollutant Emissions

As discussed above, the main difference in criteria pollutant emissions for Alternative H would be associated with the construction of the proposed community. Table 1 presents the phasing of construction activities for Alternative H.

¹ As to the HOA facility, which is not included in the description of the Proposed Project, it is estimated to be approximately 10,000 square feet in size and would be utilized exclusively by residents of the proposed community. Given the limited size and scale of this community amenity, the emissions associated with its construction and operation are sufficiently captured by the emissions inventory data for the Proposed Project.

**Table 1
CONSTRUCTION SCHEDULE – ALTERNATIVE H**

PHASE AREA →	1	5	2	3	6	7	9	4	8	Resort
Calendar Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Residential										
Single-Family Res. Units	371	200	2008	144	282	99	180	220	177	0
Mixed Use (Attached) Units		57	0	0	0	0	0	0	0	0
Retail/Commercial SF							20,000	0	0	20,000
Mixed Use Retail SF							20,000	0	0	0
Resort Retail SF										20,000
Hotel Rooms										200
Hotel Acres										9.90
Parks, acres	2.15	2.43	0	0	9.58	0	2.04	2.07	1.36	0
School, acres					9.81	0	0	0	0	0
Public Safety, acres					1.69	0	0	0	0	0
HOA Facility, acres					3.46	0	0	0	0	0
On-Site Earthmoving, cubic yards	2,904,475	1,685,400	1,287,273	721,282	4,003,433	2,320,512	1,262,930	2,436,958	1,322,816	0

The following methodology and assumptions were used:

- To update the evaluation, the construction emissions for both the Proposed Project and Alternative H have been calculated using CalEEMod Version 2016.3.2, which is the most recent version of the CalEEMod model. CalEEMod Version 2016.3.2 includes updated emission factors for offroad and on-road vehicles used in construction.
- Construction would occur with the phasing shown in Table 1.
- Grading emissions were calculated assuming a 0.5-mile transport distance, as all cut and fill activities would be confined to the project site.
- Maximum daily rock crushing activities would be the same as for the Proposed Project, with a total of 4,000 tons of rock crushed per day. The total amount of rock crushing would be 174,285 cubic yards².
- As discussed in the Blast Analysis conducted by M.H. Baxter (Attachment B), blasting activities would decrease from approximately 5.2 million cubic yards with the Proposed Project to approximately 1.9 million cubic yards with Alternative H. Blasting would include a maximum daily amount of 48,000 lbs of explosives, for a total of 95 days. The maximum daily blasting emissions would be the same as for the Proposed Project; however, the total amount of blasting and associated emissions would decrease by a factor of 2.7 based on the lower amount of cubic yards that would require blasting.³

Table 2 presents a summary of the construction emissions for the Proposed Project and Alternative H. Because rock crushing and blasting could occur in any year from 2020 through 2028,⁴ the maximum daily emissions for crushing and blasting were added to the maximum daily construction emissions for the year in which the highest construction emissions occur. For both the Proposed Project and Alternative H, the highest maximum daily construction emissions would occur in 2024. Therefore, to calculate the maximum daily emissions for construction, crushing and blasting emissions were added to the criteria pollutant emissions in 2024.

As shown in Table 2, maximum daily construction emissions (as measured in lbs/day) for Alternative H for all criteria pollutants are comparable to emissions from construction of the Proposed Project. Emissions of PM₁₀, and PM_{2.5} are lower for Alternative H than for the Proposed Project. Emissions of ROG, NO_x, CO and SO₂ are higher for Alternative H than for the Proposed Project. This slight increase is due to changes in the construction schedule (10 years versus 11 years) under Alternative H, and changes in the amounts and types of land uses that would be constructed in the maximum year.

² Hunsaker and Associates, Inc. 2018. *Preliminary Costs Budget Summary, Otay Ranch Village 13, Summary of Street Base Volume, County of San Diego*. January 30.

³ M.J. Baxter Drilling Co., 2018. *Blast Analysis, Otay Ranch Village 13 Alternative H*. January 23.

⁴ Crushing and blasting activities would not be required when constructing the resort use in 2029.

Table 2 – Maximum Daily Construction Emissions, with dust controls¹

Construction Year	VOC (lbs/day)	NO_x (lbs/day)	CO (lbs/day)	SO₂ (lbs/day)	PM₁₀ (lbs/day)	PM_{2.5} (lbs/day)
Blasting Emissions ²	-	408.00	1608.00	-	2208.00	244.80
Rock Crushing Emissions ²	1.45	19.16	5.78	0.03	14.21	4.65
2019	30.59	310.89	185.46	0.41	19.10	13.49
2020	38.29	330.10	184.28	0.46	18.09	12.48
2021	37.78	336.22	177.71	0.48	16.46	11.19
2022	36.85	310.42	175.86	0.50	16.68	10.44
2023	36.39	277.94	174.40	0.51	16.09	9.82
2024	57.99	311.99	189.52	0.61	20.70	10.71
2025	36.39	245.76	162.62	0.49	14.71	8.41
2026	50.76	276.84	168.47	0.54	15.82	8.68
2027	34.06	240.92	162.88	0.48	14.29	8.39
2028	18.29	168.55	147.30	0.35	11.75	7.65
2029	21.89	70.88	102.53	0.20	6.82	3.81
Maximum Daily Emissions – Proposed Project	59.44	763.38	1803.30	0.64	2,243.91	262.94
Blasting Emissions ²	-	408.00	1608.00	-	2208.00	244.80
Rock Crushing Emissions ²	1.45	19.16	5.78	0.03	14.21	4.65
2020	55.80	420.25	194.77	0.56	18.05	12.51
2021	40.49	302.39	175.27	0.44	16.77	11.28
2022	31.63	243.92	162.55	0.39	14.38	9.81
2023	23.92	185.92	156.39	0.35	13.08	9.03
2024	64.13	375.85	190.54	0.67	18.21	9.99
2025	18.10	248.44	157.77	0.47	12.45	7.78
2026	31.97	187.36	150.82	0.39	12.56	7.83
2027	31.64	255.67	162.80	0.49	13.38	8.13
2028	29.21	188.37	150.87	0.39	12.31	7.79
2029	21.44	67.13	99.01	0.18	5.19	3.37
Maximum Daily Emissions – Alternative H	65.58	847.41	1,808.55	0.70	2,240.42	261.96
Screening Level Thresholds (SLT)	75	250	550	250	100	55
<i>Significant Impact?</i>	No	Yes	Yes	No	Yes	Yes

Notes:

¹ Maximum daily emissions calculated using the CalEEMod Model. CalEEMod identifies the maximum daily emissions for each pollutant regardless of whether the maximum for each pollutant occurs at the same time. Maximum ROG emissions occur with the overlap of architectural coatings application, building construction, and paving for all construction years. Maximum daily emissions of all other pollutants occur with the overlap of grading, trenching, and building construction.

² Based on updated information. Maximum daily emissions conservatively assume that rock crushing, blasting, and other construction occur simultaneously.

All emissions have been modeled assuming compliance with the County's Grading, Clearing and Watercourses Ordinance and SDAPCD Rule 67.

VOC = volatile organic compounds; NO_x = oxides of nitrogen; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter; PM_{2.5} = fine particulate matter

Notably, total emissions (as measured in tons) over the course of construction would be lower under Alternative H than the Proposed Project, as shown in Table 3 below. This overall reduction in criteria pollutant emissions is attributable to the more compact development footprint associated with Alternative H, which reduces the extent of grading and other similar activities.

Table 3 – Comparison of Total Criteria Pollutants, with dust controls

Alternative	VOC (total tons)	NO_x (total tons)	CO (total tons)	SO₂ (total tons)	PM₁₀ (total tons)	PM_{2.5} (total tons)
Alternative H	31.65	210.91	221.21	0.35	116.47	19.05
Proposed Project	36.42	249.45	266.42	0.41	152.81	24.28

All emissions have been modeled assuming compliance with the County's Grading, Clearing and Watercourses Ordinance and SDAPCD Rule 67.

GHG Emissions

The following methodology and assumptions were used:

- For consistency with the GHG Analysis for the Proposed Project, CalEEMod Version 2016.3.2 was used to calculate criteria pollutant emissions from construction.
- Construction would occur with the phasing shown in Table 1.
- Grading emissions were calculated assuming a 0.5-mile transport distance, as all cut and fill activities would be confined to the site.
- Maximum daily rock crushing activities would be the same as for the Proposed Project, with a total of 4,000 tons of rock crushed per day.
- Blasting activities would decrease from approximately 5.2 million cubic yards with the Proposed Project to approximately 1.9 million cubic yards with Alternative H. Blasting would include a maximum daily amount of 48,000 lbs of explosives, for a total of 95 days. The maximum daily blasting emissions would be the same as for the Proposed Project; however, the total amount of blasting and associated emissions would decrease by a factor of 2.7 based on the lower amount of cubic yards that would require blasting.

Table 4 presents a summary of the construction GHG emission estimates for Alternative H in comparison with the construction GHG emission estimates for the Proposed Project. As shown in Table 4, construction GHG emissions for Alternative H would be lower than construction GHG emissions for the Proposed Project. This reduction in GHG emissions is attributable to the more compact development footprint associated with Alternative H, which reduces the extent of grading and other similar activities.

Table 4
COMPARISON OF ALTERNATIVE H AND PROPOSED PROJECT
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Development Scenario	Annual CO ₂ e Emissions (Metric tons/year)
Alternative H	31,904
Proposed Project	37,695

Conclusions

This analysis presents a comparison of the criteria pollutant and GHG emissions under Alternative H versus the Proposed Project. As shown in the analysis, construction emissions under Alternative H would be lower overall for both criteria pollutants and GHGs. Maximum daily construction emissions of particulate (PM_{2.5}, and PM₁₀) are lower for Alternative H than for the Proposed Project. Maximum daily construction emissions of ROG, NO_x, CO and SO₂ are slightly higher for Alternative H than for the Proposed Project; this increase is due to changes in the construction schedule (10 years versus 11 years) under Alternative H, and changes in the amounts and types of land uses that would be constructed in the maximum year.

As discussed above, while no quantitative analysis was conducted to assess reductions in VMT due to the compact land use structure of Alternative H versus the Proposed Project, a qualitative analysis of the effect indicates that the compact land use proposed under Alternative H would likely improve the effectiveness of internally-based TDM measures, and is not expected to affect externally-based TDM measures.⁵ Operational emissions under Alternative H would therefore be expected to be lower than the Proposed Project due to the increased effectiveness of internal TDM measures.



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⁵ Chen Ryan. 2019. *Transportation Demand Management Program Evaluation & SB 743 Compliance – Otay Ranch Resort Village Alternative H*.